

follow-up; 441 days, interquartile range; 150-503 days) did not differ between the two groups ($p=0.59$). One-year TLR free rate was $95.7 \pm 2.1\%$ in the small BRS group and $92.5 \pm 2.1\%$ in the large BRS group. There were no differences between groups with regards to definite stent thrombosis with 1 late thrombosis in the small BRS group and 1 acute thrombosis in the large BRS group.

CONCLUSIONS Percutaneous coronary intervention using small BRS was associated with comparable outcomes when compared to larger BRS with no observed increase in adverse events.

CATEGORIES CORONARY: Bioresorbable Vascular Scaffolds

KEYWORDS Bioresorbable scaffold, Small coronary vessels, Target lesion revascularization

TCT-526

An in-vivo multi-modality imaging study of the Absorb everolimus-eluting bioresorbable scaffold in complex coronary bifurcations

Johan Bennett,¹ Nina Vanden Driessche,² Maarten Vanhaverbeke,³ Walter Desmet,⁴ P. Sinnaeve,⁵ Tom Adriaenssens,⁶ Christophe Dubois,⁷ ¹UZ Leuven, Leuven, Belgium; ²Catholic University of Leuven, Leuven, Belgium; ³Catholic University of Leuven, Leuven, Belgium; ⁴Catholic University of Leuven, Leuven, Belgium; ⁵UZ Leuven, Leuven, Brabant; ⁶University Leuven, Leuven, Belgium; ⁷University Hospital Leuven, Leuven, Belgium

BACKGROUND This in-vivo study sought to provide insights regarding the feasibility and safety of performing complex bifurcation techniques with the Absorb everolimus-eluting bioresorbable vascular scaffold (BVS, Abbott Vascular, Santa Clara, US).

METHODS Twenty Adult New Zealand white rabbits were anaesthetized and a long 6 Fr arterial sheath was placed in the carotid artery extending to the distal aorta. Heparin was administered. Bifurcation stenting procedures of the aorta-iliac bifurcation (70° angle) were performed with 3.0x28 mm BVS using the following techniques: main-vessel (MV) stenting with ballooning of side branch (SB) through the BVS struts (Provisional stenting, $n=5$), T-and protrusion (TAP, $n=5$), modified T ($n=5$) and culotte ($n=5$) stenting. Proximal optimization technique with 3.5 mm non-compliant (NC) balloons at 16 atm and mini-kissing balloon post-dilatation with 3.0 NC balloons at 5 atm were performed in all procedures. Angiography, optical coherence tomography (OCT) and post-procedural micro-computed tomography (micro-CT) were performed.

RESULTS In all procedures angiographic results were excellent with no evidence of dissection or SB compromise. Re-crossing through BVS struts with guidewires and balloons +/- second BVS (TAP + culotte procedures) was smooth. Provisional stenting optimally opened the SB ostium without deforming the BVS. On OCT there was no malapposition and micro-CT revealed good SB aperture and a single connector fracture was present in the MV in 1 of the 5 cases. Modified T stenting (SB stented first, $n=5$) and TAP stenting (MV stented first, $n=5$) resulted in complete coverage of the SB ostium and carina. In both techniques no significant malapposition was present. On Micro-CT, no strut fractures were present following modified T stenting, whilst in 3 out of 5 TAP procedures single strut fractures were noted, these did not cause luminal compromise. Culotte stenting ($n=5$) resulted in complete coverage of the bifurcation with an extensive proximal segment of double-layered scaffold struts. In 3 of the 5 culotte procedures, OCT revealed significant circumferential malapposition at the level of the bifurcation. On micro-CT there was distortion of MV and SB scaffolds at the level of the bifurcation with single strut fractures present in all 5 cases. These fractures did not cause luminal compromise.

CONCLUSIONS In this non-diseased in-vivo aorta-iliac bifurcation model, it was feasible to perform complex bifurcation stenting using Absorb BVS with excellent angiographic results. Provisional stenting with additional TAP stenting seems a reasonable standard approach for most bifurcation lesions. When a 2-stent technique is planned from the outset, modified T-stenting was the most promising with no evidence of significant malapposition or scaffold disruption on OCT and micro-CT, respectively. Finally, culotte stenting frequently caused significant circumferential malapposition, scaffold distortion and strut fractures, the clinical impact of which is unknown.

CATEGORIES CORONARY: Stents: Bioresorbable Vascular Scaffolds

KEYWORDS Bifurcation stenting, Bioabsorbable scaffolds, OCT

TCT-527

Long-term Clinical Outcomes of Patients Treated With The Everolimus-eluting Bioresorbable Vascular Scaffold. The BVS Expand Study

Cordula Felix,¹ Jiang-Ming Fam,¹ Yoshinobu Onuma,¹ Yuki Ishibashi,¹ Bert Everaert,¹ Roberto Diletti,¹ Evelyn Regar,¹ Nicolas M. Van Mieghem,¹ Joost Daemen,¹ Peter De Jaegere,¹ Felix Zijlstra,¹ Robert J. Van Geuns¹ ¹Thoraxcenter, Erasmus MC, Rotterdam, Zuid-Holland, the Netherlands

BACKGROUND Multiple studies have proven safety and feasibility of the BVS bioresorbable scaffold. However, most of these studies were restricted by rather non-complex lesions or short follow-up.

METHODS This is an investigator initiated, prospective, mono-center, single-arm study. Inclusion criteria were patients presenting with NSTEMI, stable, unstable angina, or silent ischemia caused by a de novo stenotic lesion in a native previous untreated coronary artery. Lesions with a Dmax (proximal and distal mean lumen diameter) within the upper limit of 3.8 mm and the lower limit of 2.0 mm by online QCA were obligatory. Exclusion criteria were patients with a history of CABG, presentation with cardiogenic shock, bifurcation lesions requiring kissing balloon post-dilatation, STEMI patients requiring immediate stent implantation, allergies or contra-indications to antiplatelet therapy, female patient with child bearing potential not taking adequate contraceptives or currently breast-feeding, expected survival of less than one year. Procedural outcomes and clinical outcomes were assessed.

RESULTS From September 2012 to January 2015, 250 patients with 335 lesions were enrolled in this study. A total of 445 BVS were placed with a mean number of implanted scaffolds/ patient of 1.37. Pre-dilatation was performed in 89.8%. Predilatation balloon: artery ratio was 1.05 ± 0.23 . Post-dilatation was performed in 54.3%. In 14.5% baseline imaging using IVUS was used; OCT in 24.9%. Bifurcation was present in 21.4%, calcification in 42.2% and total occlusions in 4.2%. In 38.0% there were AHA classification type B2/ C lesions. Mean lesion length was 22.10 ± 13.90 mm. Pre-procedural reference vessel diameter (RVD) was 2.42 ± 0.74 mm, minimal lumen diameter (MLD) 0.91 ± 0.45 mm and percentage diameter stenosis (%DS) 59.13 ± 0.72 . Post-procedural QCA characteristics were as followed: RVD 2.77 ± 0.46 mm, MLD 2.30 ± 0.42 mm and %DS 16.90 ± 9.04 . Median follow-up period was 559 days (interquartile range [IQR], 371-733 days). Up to 12 months three patients died (all cardiac death) with a Kaplan Meier estimate of 1.4% at one year. Rate of all myocardial infarction (MI) was 4.1%, definite scaffold thrombosis (ST) 1.4%, target lesion revascularization (TLR) and target vessel revascularization (TVR) were 3.7%. Non-target vessel revascularization (non-TV) was 3.8%. Major cardiac adverse events (MACE, a composite endpoint of cardiac death, TLR and all MI) at one year was 5.5%.

CONCLUSIONS Long-term results in a mixed group of patients imply that BVS usage is associated with favorable clinical outcomes.

CATEGORIES CORONARY: Bioresorbable Vascular Scaffolds

KEYWORDS Bioabsorbable scaffolds, Coronary artery disease, PCI - Percutaneous Coronary Intervention

TCT-528

Bioabsorbable Vascular Scaffold Overexpansion: Insights from in-vitro post-expansion experiments

Nicolas Foin,¹ Renick D. Lee,¹ Alessio Mattesini,² Jing Ni Chan,³ Yingying Huang,⁴ Gianluca Caiazzo,⁵ Enrico Fabris,⁶ Ismail D. Kilic,⁷ Subbu S. Venkatraman,³ Carlo Di Mario,⁸ Philip Wong,¹ Holger Nef⁹ ¹National Heart Centre Singapore, Singapore, Singapore; ²Careggi Hospital, Florence, Italy; ³Nanyang Technological University, Singapore, Singapore; ⁴Nanyang Technological University, Singapore, CA; ⁵S. Giuseppe Moscati Hospital, Napoli, Italy; ⁶BRU, Royal Brompton NHS Trust, London, United Kingdom; ⁷Royal Brompton NHS Trust, London, United Kingdom; ⁸Imperial College London, London, United Kingdom; ⁹Justus-Liebig University of Giessen, Giessen, Germany

BACKGROUND While Bioresorbable Vascular Scaffolds (BVS) are increasingly used in clinical practice, behavior when post-dilated beyond their recommended maximum over-expansion diameter remains sparsely documented.

METHODS We examined the post-expansion behavior of the Bioresorbable Vascular Scaffold (3.0mm and 3.5mm Absorb BVS; Abbott Vascular, Santa Clara, CA) after over-expansion with Non-Compliant (NC) balloons of increasing diameters. After each oversizing step, the scaffolds were measured and inspected for strut disruption using